du Treil, Lundin & Rackley, Inc.
A Subsidiary of A.D. Ring, P.A.

May 15, 1996

Secretary
Office of the Secretary
Federal Communications Commission
1919 M Street
Washington, DC 200054

Dear Sir/Madam:

Enclosed please find an original and 6 copies of our Firm's comments regarding MM Docket No. 96-58.

We would appreciate it if you could stamp one copy and return it to us in the enclosed self-addressed, stamped envelope.

Sincerely,

Louis R. du Treil, Sr.
President

LRdT:bly

Enclosures

dLR:2232

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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Parts 73 and 74	)	**MM Docket No. 96-58**
of the Commission's Rules To	)	
Permit Certain Minor Changes in Broadcast	)	
Facilities Without a Construction Permit	)	

COMMENTS OF du TREIL, LUNDIN & RACKLEY, INC.

INTRODUCTION

The professional engineering firm of du Treil, Lundin and Rackley, Inc. and it's predecessor firms have provided technical engineering service to the broadcasting and communication industries for over 50 years. We are pleased to submit the following comments regarding certain FCC rules as outlined in the Notice of Proposed Rule Making "NPRM" in MM Docket No. 96-58.

Except as specifically stated, we agree with the Commission's goal of simplifying the regulatory processes.

The following comments refer to the specific paragraphs in the NPRM.

5. INCREASES IN EFFECTIVE RADIATED POWER (ERP) FOR NON-GRANDFATHERED AND NON-CONTOUR PROTECTION FM COMMERCIAL STATUS

We agree with most of the proposal.

Of the five exceptions in paragraph 6 of the NPRM requiring filing of Form 301, would it not be possible for those stations in the radio quiet zone, etc. to obtain prior clearance from the affected agency and then file the application for license on Form 302. This pre-notification is

recommended in the rules and is usually followed before preparation of an application specifying an increase in ERP.

A station should be allowed to decrease power to the minimum for its class provided proper signal is given it's community of license. Such a showing could be required in filing of Form 302-FM. Public interest concerns are perceived to be minimal in light of the numbers of AM an FM stations in existence and in light of recent ownership rules permitting concentration of ownership. In addition, a station may apply for minimum facilities initially without triggering a public interest concern.

It is believed that applications specifying a reduction in power will be rare, usually occurring at the initial licensing stage, as pointed out by the Commission. It is a fact that the vast majority of broadcasters seek to maximize coverage, and reduction of antenna height is only found acceptable, lacking a better alternative.

9. PROGRAM TEST OPERATION FOR FM STATIONS WITH DIRECTIONAL ANTENNAS

With one exception, we agree with the proposed rule. Operating a directional station at half power, and not at the ERP corresponding to the deepest null of the pattern, should be quite adequate to protect other stations while the FCC staff reviews the application. It is assumed that such applications would receive the staff's immediate attention, therefore any deviation of pattern shape or size from that authorized, should be sufficiently mitigated at half power without the additional requirement of checking the minimum power in a pattern null. One half power is easy to understand and implement; whereas an ERP corresponding to the deepest null of the directional pattern requires some technical knowledge. We strongly recommend use of only half power during this minimal pre-licensing period.

11. REPLACING ONE FM OR TELEVISION DIRECTIONAL ANTENNA WITH ANOTHER.

We agree with this proposal, except in two instances. Some non-commercial educational stations which are collocated with a TV channel 6 station, so as to reduce potential interference, are required to employ an antenna with a vertical radiation characteristic emulating the characteristic of the television antenna. Stations having this condition should probably be required to file FCC Form 301 for an antenna change.

As proposed, radiation rights are not altered, and there should be no requirement regarding 85% pattern "fill" for directional antennas. (See further discussion with paragraph 25.)

12. DELETION OF CONTOUR PROTECTION STATUS FOR FM COMMERCIAL STATIONS

We agree with the Commission's proposal.

13. USE OF FORMERLY LICENSED MAIN FACILITIES AS BROADCAST AUXILIARY FACILITIES (AM, FM AND TELEVISION)

We agree with the Commission's proposal.

14. CHANGES TO THE VERTICALLY POLARIZED ERP FOR FM AND TELEVISION STATIONS.

We agree with the Commission's proposal.

17. CHANGES IN HEIGHT OF ANTENNA RADIATION CENTER.

Lowering of an antenna height should not be limited to 4 meters. Antenna height could be reduced without limit, provided the required signal is provided the city of license. Normally, as suggested in the NPRM, the reduction in height is needed to accommodate existing antennas, guy wires, etc. It is highly unlikely that a station would not seek the maximum height available so as to provide service to the greatest possible audience. Antenna height reductions are not likely to be common place except in the initial construction stage.

19. MAIN STUDIO CHANGES.

We agree with the Commission's proposal.

21. COMMERCIAL STATIONS CHANGING TO NONCOMMERCIAL EDUCATIONAL STATUS.

We agree with the Commission's proposal.

22. ADDITIONAL CLARIFICATIONS TO 47 C.F.R. §§ 73.1620 AND 73.1690.

These rules should only include the half power provision and not power related to the deepest null of the directional antenna pattern.

23. CONTINUATION OF PROTECTION TO AM STATIONS.

Although we agree that AM antenna systems should receive some protection, it is our opinion that proof requirements could be reduced. For example, in the case of a tower possibly affecting a directional AM array, careful measurement of directional antenna parameters before and after construction, and before and after monitoring point readings should adequately protect the integrity of the directional antenna system.

In addition, these requirements do not coincide with other FCC rules governing towers in cellular, two-way or similar services, which are not as stringent. See 47 CFR 22.371. We believe it appropriate to relax the broadcast standards to comport with other FCC rules.

24. CLARIFICATION TO CHANNEL 6 TELEVISION - FM EDUCATIONAL RULES IN 47 C.F.R. § 73.525 AND 47 C.F.R. § 73.599.

We support the Commission's endeavor to clarify the proper use of the desired-to-undesired protection ratios when a FM educational stations TV-6 interference area is within or intersecting the television station's predicted 90 dBu field strength contour. When the current Channel 6 Television-FM Educational Rules were being developed, the collocation of a TV-6 station and a FM educational station, with similar transmitting antenna vertical radiation patterns, was encouraged. This collocation of the stations preserves the television station's interference-free service area and relieves the need for a FM station to determine the interference area. The motivation of this collocation should be continued by not allowing a decrease in the desired-to-undesired protection ratios which would occur above 90 dBu.

Additionally, as noted by the Commission, the effect from the television station's transmitting antenna vertical pattern may produce concentric areas of lower field strength near

the TV-6 television transmitter location. These areas of lower field strength are typically contained within a television station's 90 dBu field strength contour and incidentally aggravate the interference to a television channel 6 station. However, the Channel-6 and likewise, the Educational-FM, transmitting antenna vertical patterns are not considered by the Commission in the *Calculation of Predicted Interference Area and Population* (Section 73.525(e)). Therefore, rather than produce a computationally complex procedure to determine the interference area based on the antenna vertical patterns, we agree with the Commission that the television field strengths above 90 dBu should be considered as if the 90 dBu field strength were constant everywhere within that contour.

We also suggest modification of Section 73.525(e)(4)(i) of the Commission's Rules to relax the interpretation of a "heavily populated area". Section 73.525(e)(4) permits an Educational-FM station to employ vertically-only polarized transmissions to permit greater radiated power beyond which would be permitted for horizontally polarized transmissions. The formula to determine the maximum vertically-only polarization is dependent if the interference area is entirely outside the limits of a city of 50,000 persons or more. We propose a broader term such as a Census Designated Place (CDP) should be employed along with the strict term of city within the regulation.* The intent of the Section 73.525(e)(4)(i) is to prevent a greater degree of interference to a Television-6 facility in a heavily populated area defined with a population greater than 50,000 persons. The area should not be constrained to just a city, but also encompass CDP's.

25. REQUIREMENT THAT FM MEASURED DIRECTIONAL COMPOSITE PATTERN FILL 85% OR MORE OF FM DIRECTIONAL COMPOSITE PATTERN.

The Commission believes it necessary to require a directional antenna proponent to "fill" 85% of the composite pattern with the measured composite pattern so as to promote "efficient use of the scarce FM broadcast spectrum". We believe this proposed rule is unnecessary as it places an unwarranted burden on stations which must use, or choose to use a directional antenna.

As to spectrum efficiency, it is perfectly within FCC rule parameters, for example, for a Class C1 station to operate with a maximum facility having effective radiated power (ERP) of 100 kilowatts and antenna height above average terrain (HAAT) of 299 meters. Such a maximum Class C1 facility produces a 60 dBu contour at a distance of 72 kilometers enclosing an area of 16,278 square kilometers. It is also permissible for a Class C1 station to operate with

* A Census Designated Place (CDP) is defined by the *Bureau of the Census* as a bounded area with densely settled concentrations of population that are identifiable by name, but are not legally incorporated places.

an ERP of 51 kilowatts and HAAT of 31 meters (or less). Such a minimal facility produces a 60 dBu contour of 27 kilometers and encloses an area of 2,289 square kilometers. In terms of coverage area, the Class C1 station with minimal facilities provides only 14% of the coverage area potentially available to such a station.

In the case of a Class A station operating with maximum facilities of 6 kW ERP and 100 meters HAAT versus a minimal facility of 100 watts ERP and HAAT of 31 meters, the percentage of coverage area of the minimal facility is only 4.1% of a maximum facility coverage area. Many class C stations operate with antenna heights barely above the minimum. Clearly, these stations are "wasting spectrum".

These examples show that the existing rules contemplate and permit what might be characterized as "inefficient use" of FM spectrum.

A station employing a directional antenna must prove its radiation pattern by measurement; however, a non-directional station, especially one with side-mounted antenna, may suffer infirmities, possibly resulting in reduced coverage, but escapes an additional level of rule compliance proposed for directional antennas.

Does it make sense to apply this rule to a station which voluntarily employs a directional antenna? A station in Miami, for example, might choose to operate directionally to avoid wasting energy over the Atlantic Ocean or over the Everglades. Is such directional antenna usage insufficient? Should such an operator be penalized?

It is also possible for a measured composite directional pattern to have coverage with the horizontal polarization component different from the vertical polarization component. As is well known, the FCC rules recognize only the horizontal polarization component as primary, with vertical polarization permitted. With this in mind, one can visualize a measured composite pattern for the lower half of the pattern to be the result of the horizontal polarization component and the upper half to be the vertical polarization component. Although meeting the proposed 85% requirement, the mandated horizontal component covers about 50 percent of the area. These types of situation do not lend themselves to the simplistic 85% solution suggested by the Commission.

The NPRM states that the proposed rule "conform[s] the FM broadcast service to the AM service in this regard". This is not the case, as the directional antennas employed in the AM and FM service have completely different attributes

For example, in an AM directional antenna system, the pattern is formed by use of strategically placed radiators (towers) in which the phase and current of the RF energy is

controlled. On the other hand, an antenna in an FM directional system is basically an omni-directional antenna, the radiation pattern of which is intentionally modified by use of "directors" or "spoilers" or unintentionally modified by the antenna's surrounding, i.e. tower structure, mounting pole and brackets, etc. The FM pattern designer does not directly control the current and phase of the individual elements of the antenna.

The 85% rule as it pertains to AM directional antenna originated because of the design of certain antenna systems which produced large circulating currents, low antenna driving point impedances and consequent internal losses. These factors are now well known to competent AM directional antenna designers and are rarely a problem in modern engineering[†]. The FM pattern designer is not confronted with these electrical difficulties but of "fitting" a pattern into a site sensitive radiation pattern envelope.

There is another substantial difference between AM and FM directional antenna systems. The FM pattern is heavily dependent on the site location, terrain and coverage to be achieved. An AM array design is primarily sensitive to coverage and potential interference. Move of an AM array a few miles is not expected to result in large coverage change, where a change of an FM site by a relatively small amount can result in dramatic coverage change, with widely varying directional antenna patterns.

As is quite possible, omni-directional antennas can experience manufacturing, mounting and other environmental difficulties, which can adversely affect the stations operation but because the problem has not been measured, as in the case of a directional antenna, such a station is relieved from further FCC intervention.

This 85% rule for FM directional patterns is unnecessary and places an additional burden on stations which elect to, or must use a directional antenna. Similarity to AM is misplaced as is the argument of spectrum "efficiency". The rule should not be adopted.

[†] It may be appropriate in this NPRM to eliminate the 85% rule of AM stations because of modern design techniques and availability of numerous incremental power levels to compensate for loss of antenna systems. The current 85% rule for AM stations was initiated when discrete power levels of 0.25, 0.5, 1.0, 5, 10, 25 or 50 kilowatts were the FCC standard, whereas variable level are now permitted.

CONCLUSION

We believe that the proposed rules, as modified by these comments, will protect the integrity of broadcast stations while eliminating unneeded and unwarranted additional effort in the licensing process.

Respectfully submitted.

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John A. Lundin

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Louis R. du Treil, Jr.

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